What Will It Take?
King County Energy Map and Carbon Wedge Analysis

February 13, 2014

King County-Cities Climate Collaboration

New Energy Cities

King County's Community Level Greenhouse Gas (GHG) Reduction Goal: *80 percent below 2007 levels by 2050*

- Avoid most devastating impacts of climate change (2°C limit)
- Five cities have adopted goals of 80x2050 or carbon neutrality
- 19 of 39 King County cities adopted U.S. Mayors' GHG red. targets
- King County's Growth Management Planning Council process will develop shared regional and near-term targets

40% reduction by 2030 can be used as a "stair step" approach toward the 2050 goal

KING COUNTY-Cities CLIMATE COLLABORATION

New Energy Cities

Key Data Sources for Energy Map & Carbon Wedge Analysis

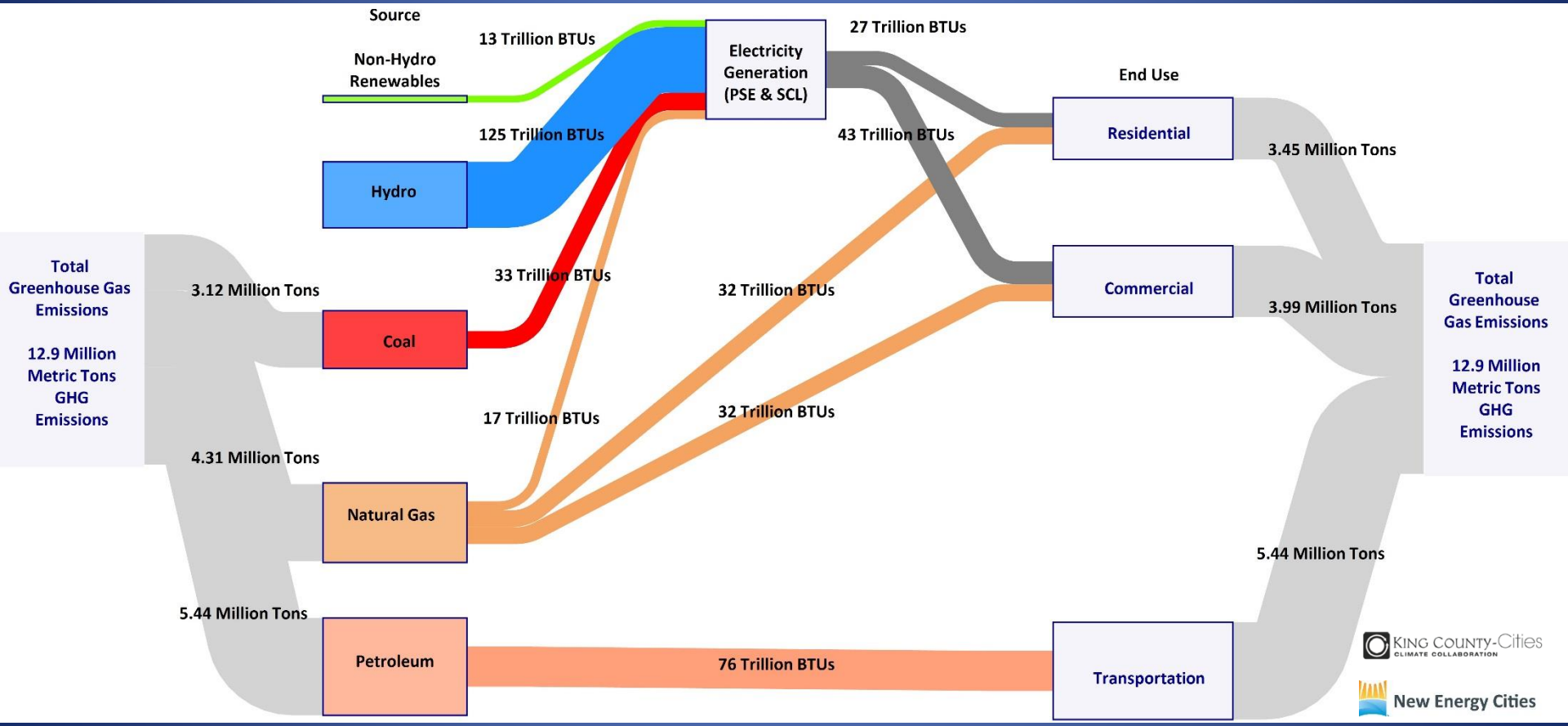
Category	Measure/Assumption	Sources
Transportation	Vehicle miles traveled	Puget Sound Regional Council, King County
Commercial*	Electricity and natural gas consumption	Seattle City Light, Puget Sound Energy
Residential	Electricity and natural gas consumption	Seattle City Light, Puget Sound Energy
Population growth	Projected population growth	State Office of Financial Management, King County

*Including industrial energy consumption

KING COUNTY-Cities CLIMATE COLLABORATION

New Energy Cities

2012 King County Energy & Carbon Map



Cities account for ~90% of King County's total electricity & natural gas use

Utility Fuel Mix (2012)

Seattle City Light

Source	Percentage
Hydropower	90%
Nuclear	4.4%
Wind	3.9%
Coal	0.76%
Landfill	0.50%
Biomass	0.32%
Natural Gas	0.30%

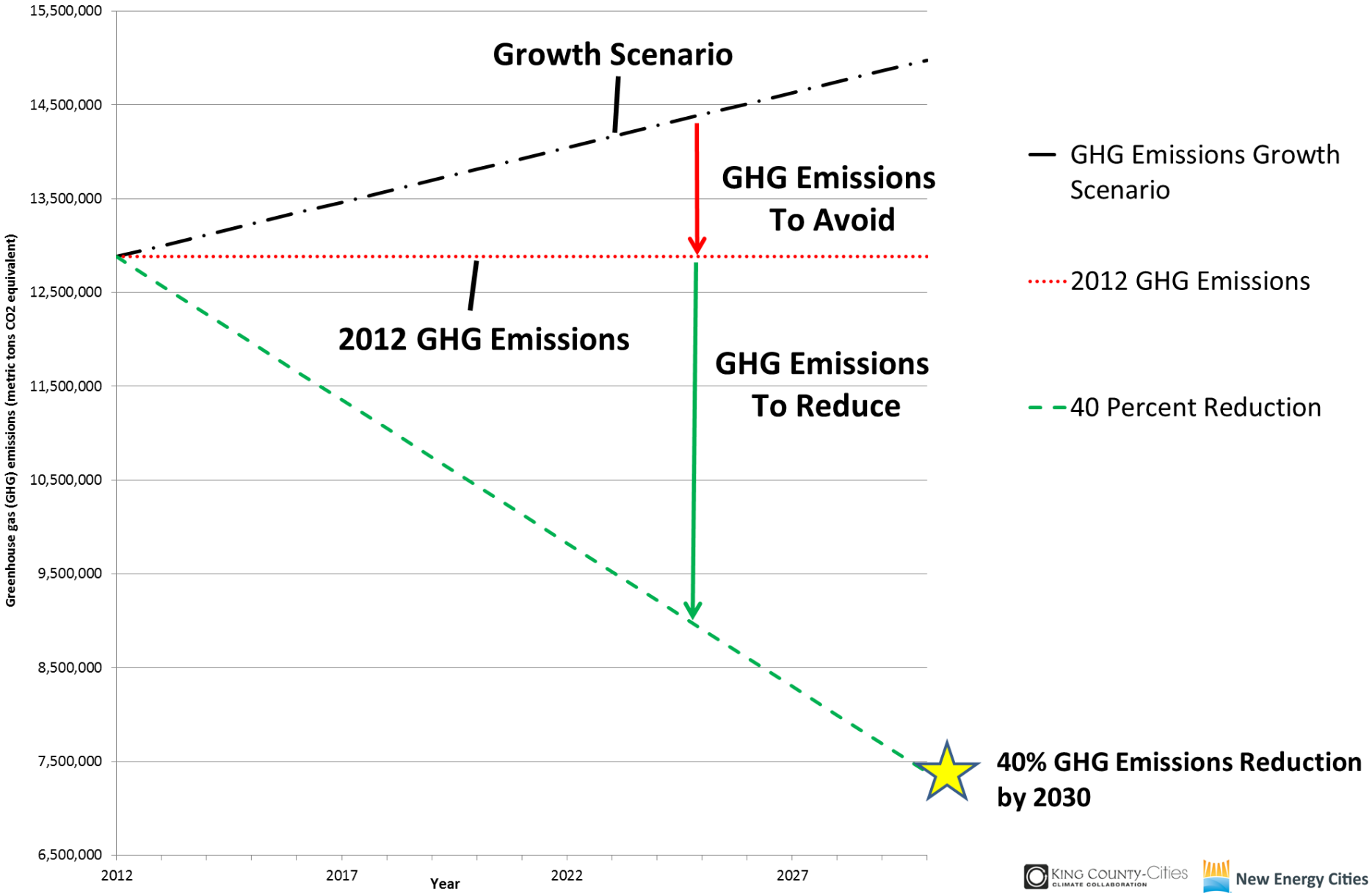
Cogeneration and solar were each less than 0.1% of City Light's fuel mix in 2012.

Puget Sound Energy

Source	Percentage
Hydropower	42%
Coal	30%
Natural Gas	16%
Wind	8.4%
Cogeneration	2.1%
Nuclear	1.3%
Waste	0.24%
Biomass	0.23%
Petroleum	0.18%

Solar was less than 0.1% of Puget Sound Energy's fuel mix in 2012.

Potential GHG Growth v. 40x2030 Reduction



KING COUNTY-Cities CLIMATE COLLABORATION

New Energy Cities

40 Percent Reduction by 2030: What Will It Take?

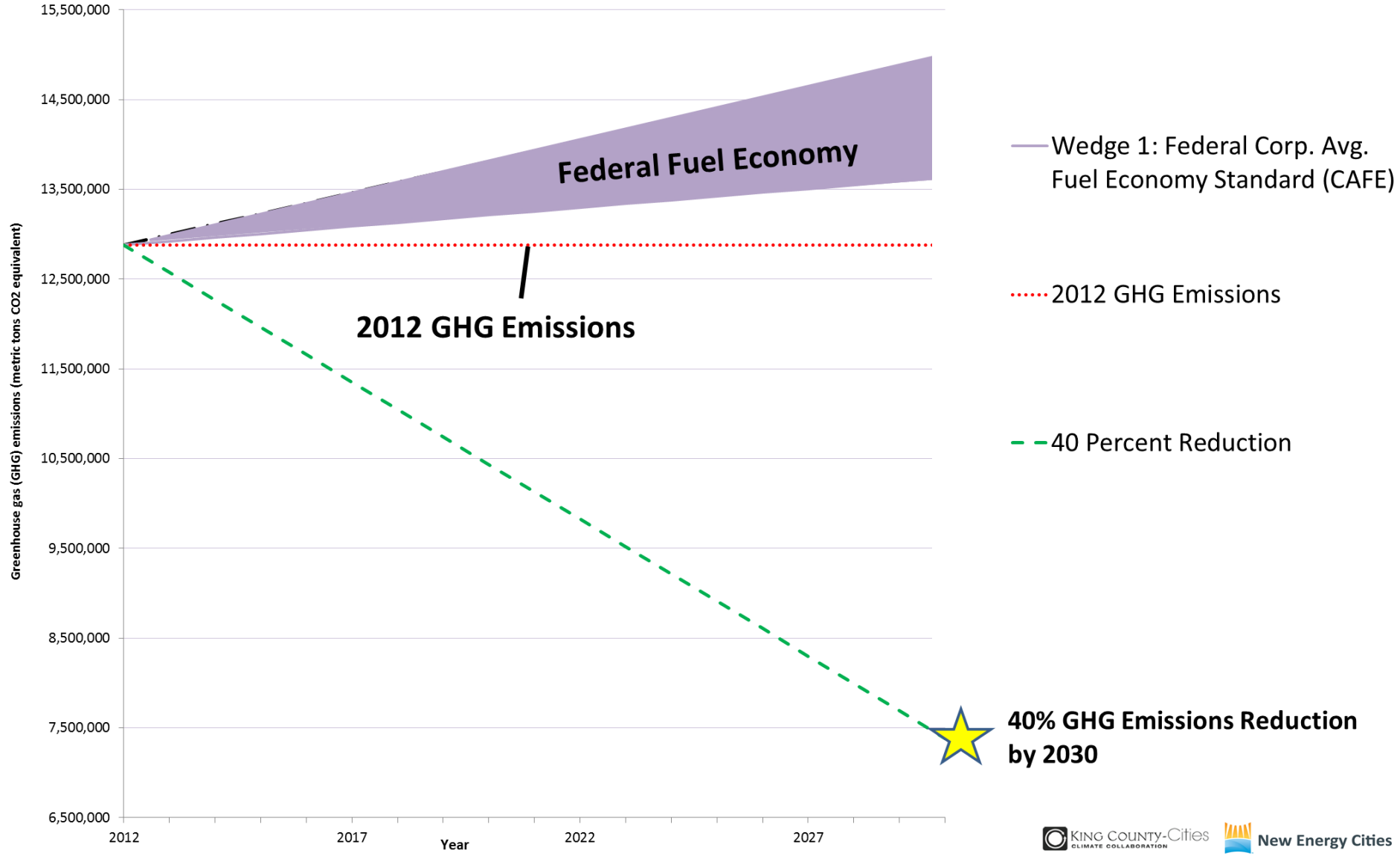
First we estimated the greenhouse gas (GHG) emission reduction due to three existing federal & state laws

Level	Sector	Law or Policy	What the Law or Policy Requires
Federal	Transportation	Corporate Average Fuel Economy Standard	Analysis assumes 2030 avg. fuel economy of 27.3 miles per gallon
State	Energy supply	Renewable Portfolio Standard	At least 15 percent of total fuel mix must come from renewable energy by 2020
State	Energy consumption	Washington State Energy Code	New buildings constructed in 2031 must use 70 percent less energy than new buildings constructed in 2006

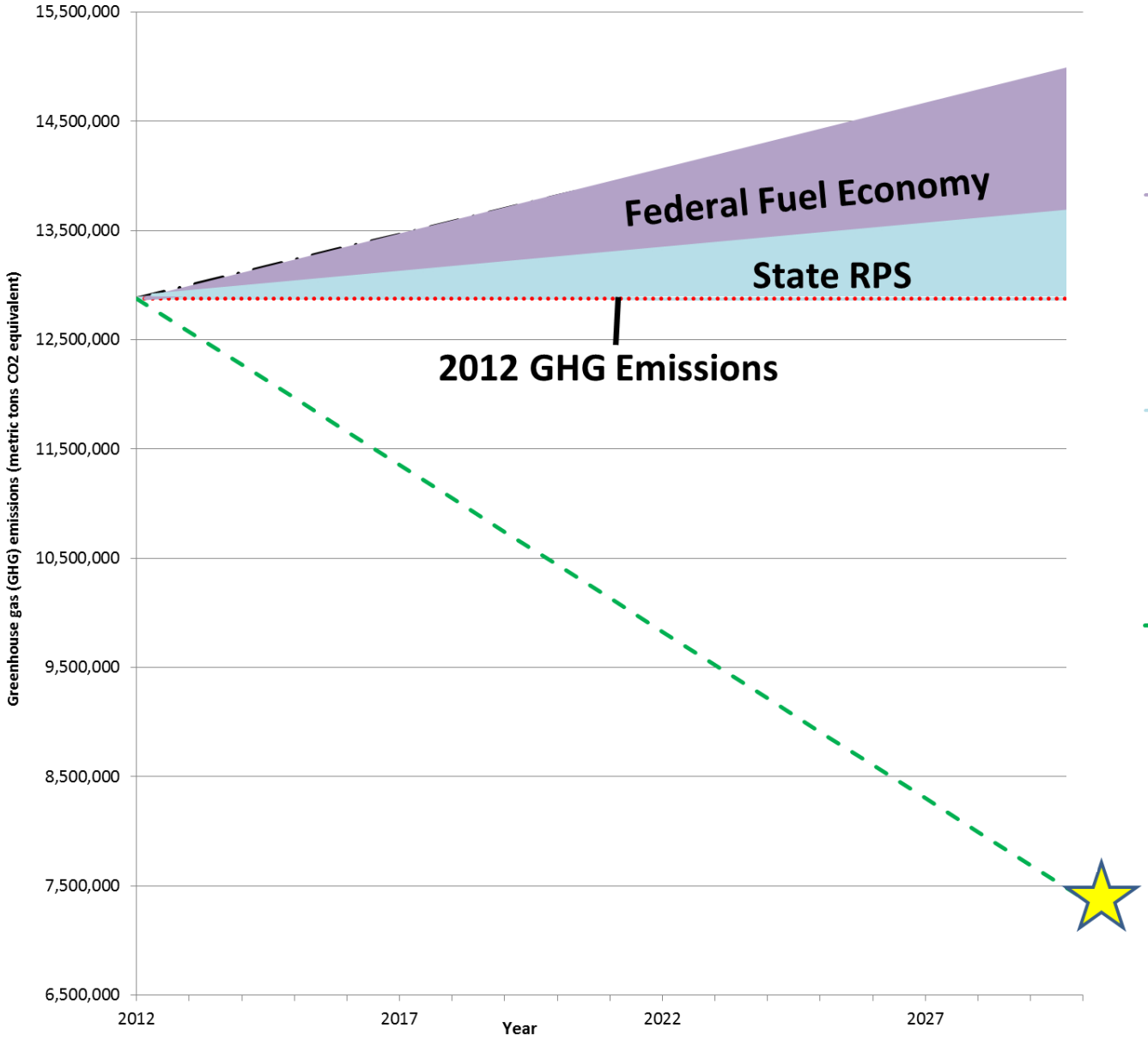
King County-Cities Climate Collaboration

New Energy Cities

Reduction Due to Federal Vehicle Fuel Economy (CAFE) Standard



Reduction Due to State Renewable Energy Law



Wedge 1: Federal Corp. Avg. Fuel Economy Standard (CAFE)

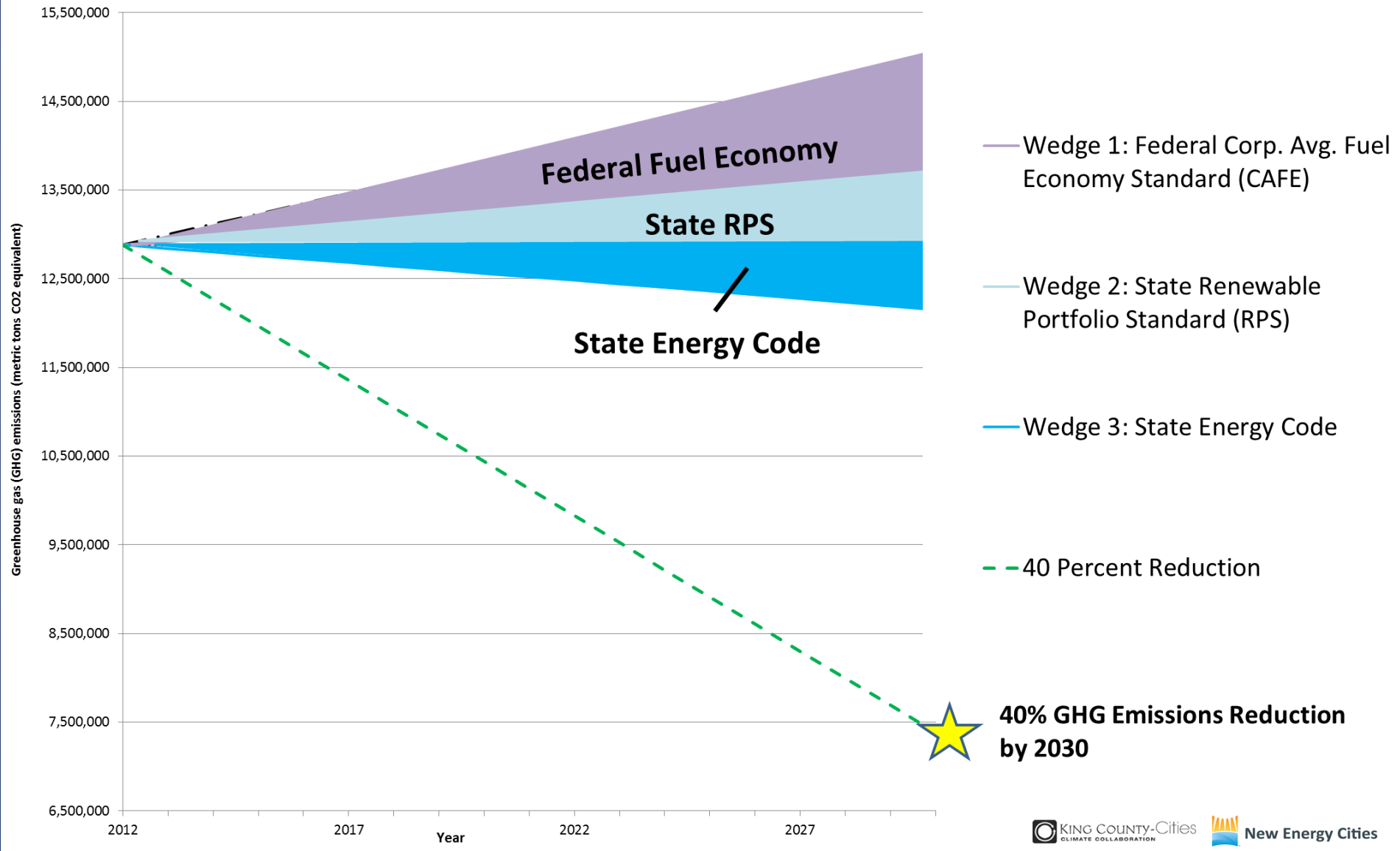
Wedge 2: State Renewable Portfolio Standard (RPS)

40 Percent Reduction

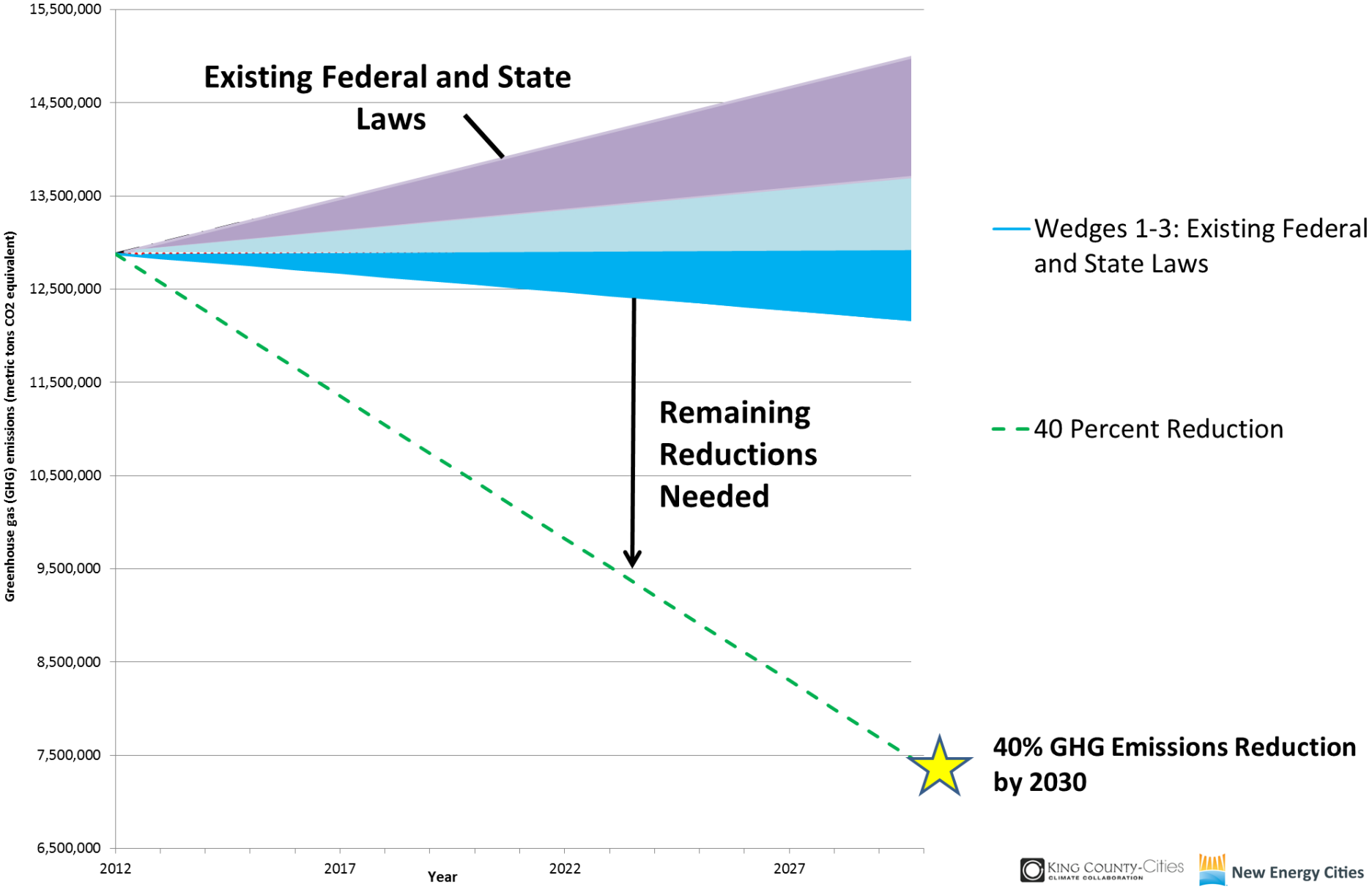
KING COUNTY-Cities CLIMATE COLLABORATION

New Energy Cities

Reduction Due to State Energy Code



Reduction Due to Existing Fed. & State Laws



KING COUNTY-Cities CLIMATE COLLABORATION

New Energy Cities

What Will It Take? (Part 2)

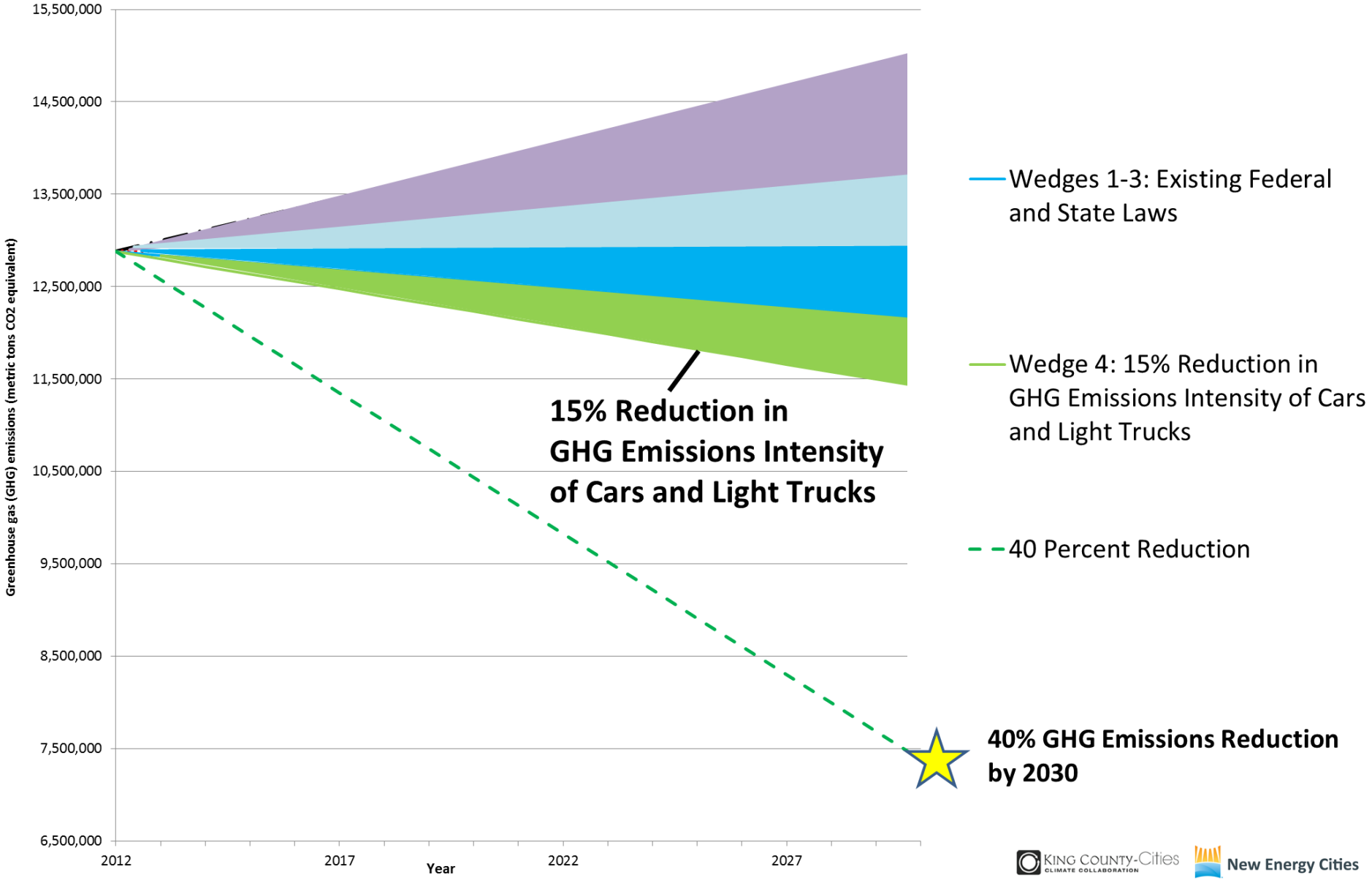
We then estimated the GHG emission reduction associated with strategies in three areas, consistent with national best practices

Category	80x2050 Pathways	Potential Pathways for King County Cities
Transportation	▪ 25% reduction in transportation GHG emissions overall ▪ 25-38% percent reduction in emissions per VMT by 2030 ▪ Annual net decreases in VMT	▪ 15% reduction in vehicle GHG emissions intensity by 2030 (less ambitious than 80x50 pathway) ▪ 10% reduction in vehicle miles traveled by 2030 (less than State of WA policy goal)
Energy efficiency	▪ Net zero emissions in new buildings by 2030 ▪ 15-25% emissions reduction in existing buildings by 2030	▪ Net zero emissions in new buildings by 2030 (per city code authority) ▪ 25% reduction in energy use from existing buildings by 2030 (incl. natural gas consumption for heating)
Renewable energy	▪ Electricity and heating supply is 80-90% renewable energy	▪ 90% renewable energy use countywide (incl. hydro) & no coal in electricity by 2030

KING COUNTY-Cities CLIMATE COLLABORATION

New Energy Cities

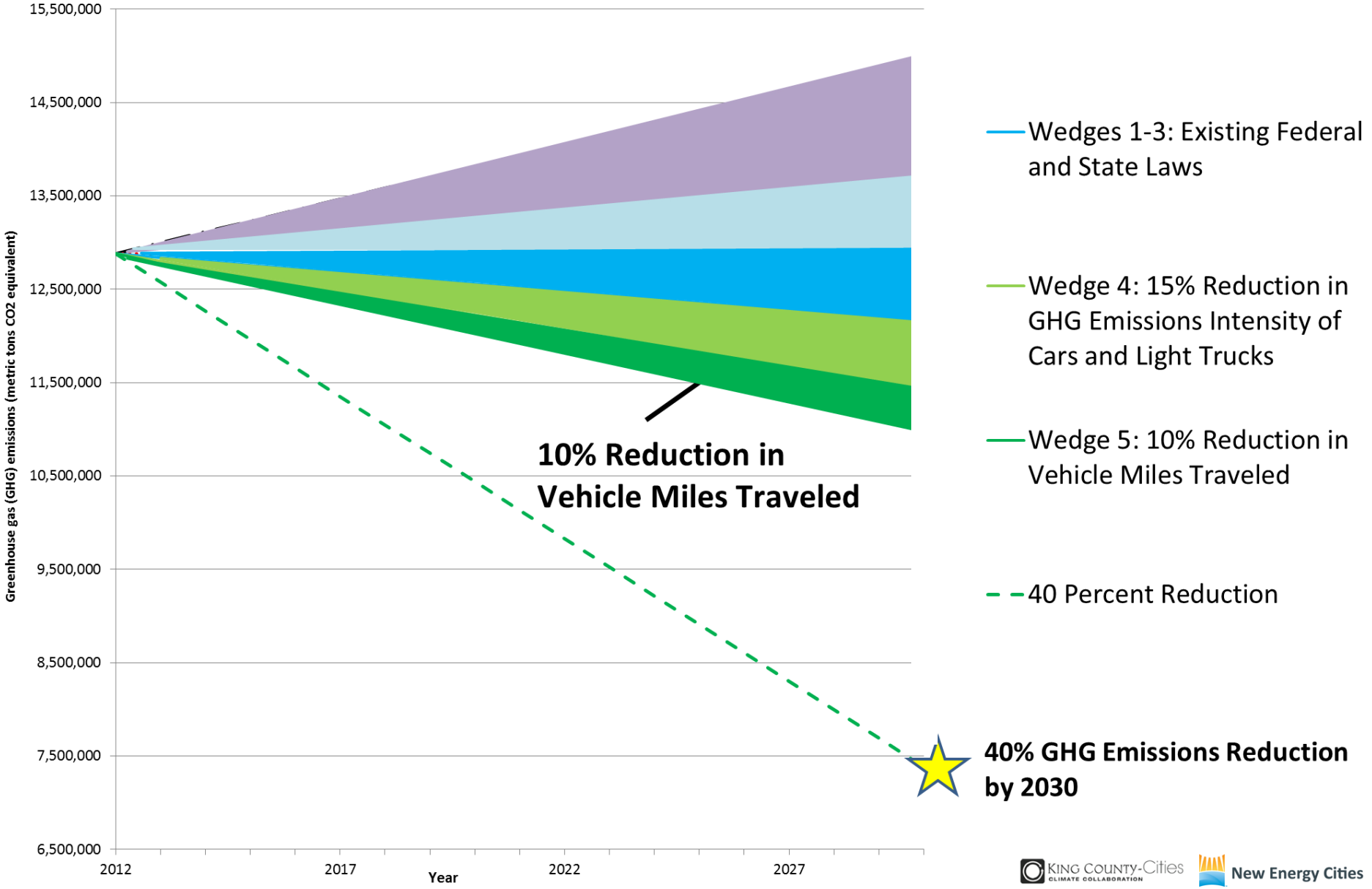
15% Red. in Vehicle Emissions Intensity



KING COUNTY-Cities CLIMATE COLLABORATION

New Energy Cities

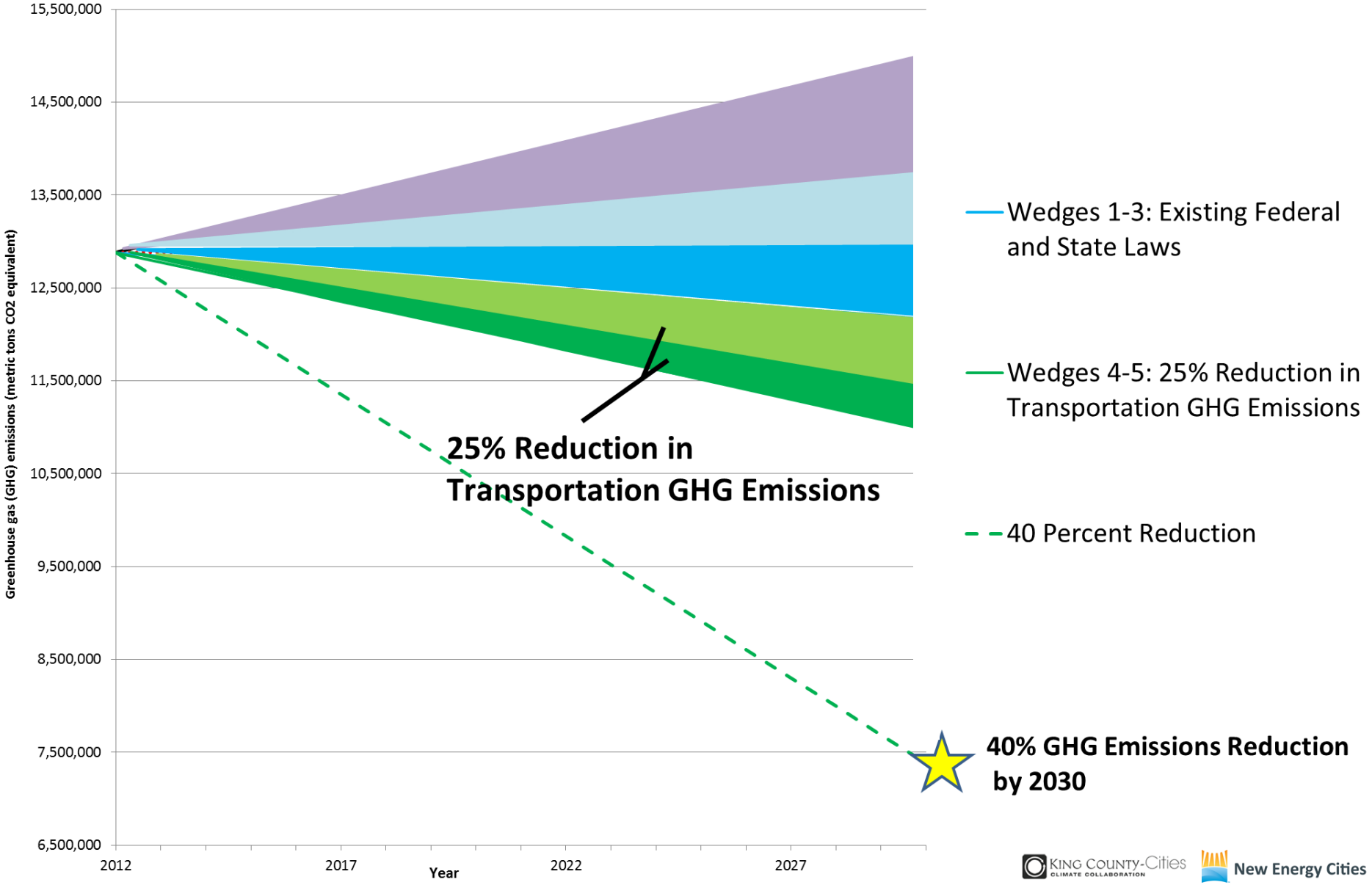
10% Reduction in Vehicle Miles Traveled



KING COUNTY-Cities CLIMATE COLLABORATION

New Energy Cities

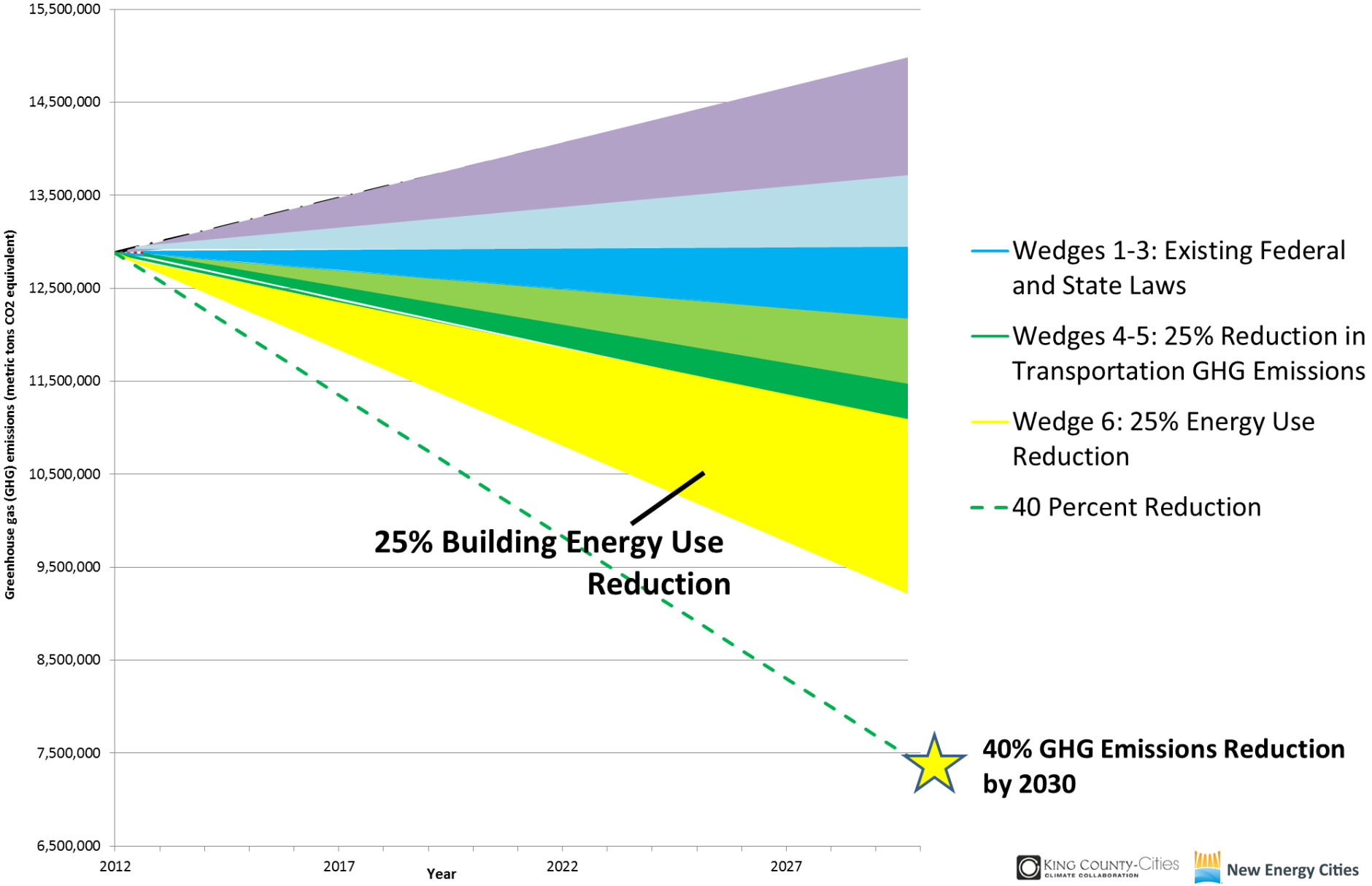
Combined: 25% Red. in Transportation GHG



KING COUNTY-Cities CLIMATE COLLABORATION

New Energy Cities

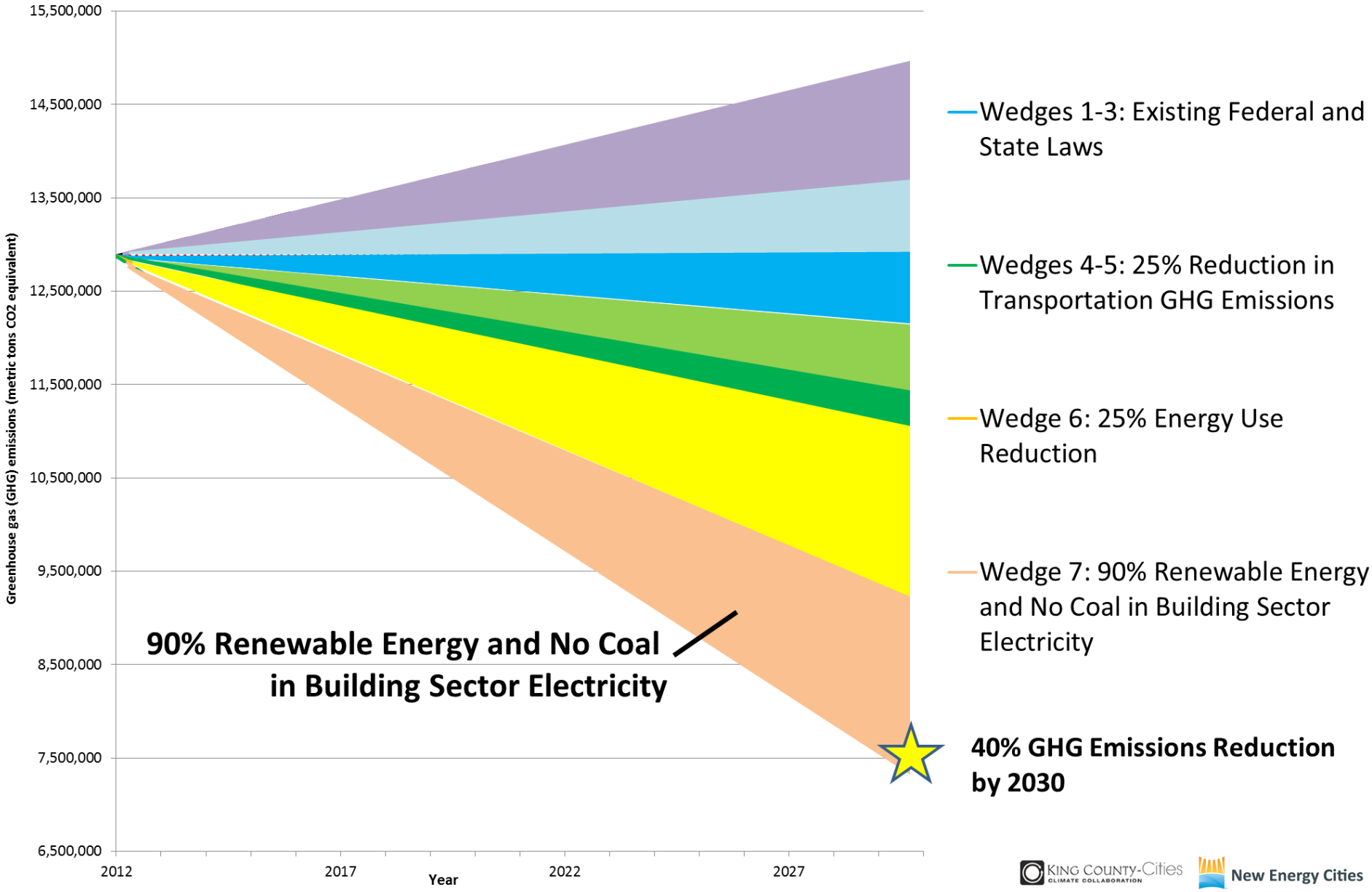
25% Building Energy Use Reduction



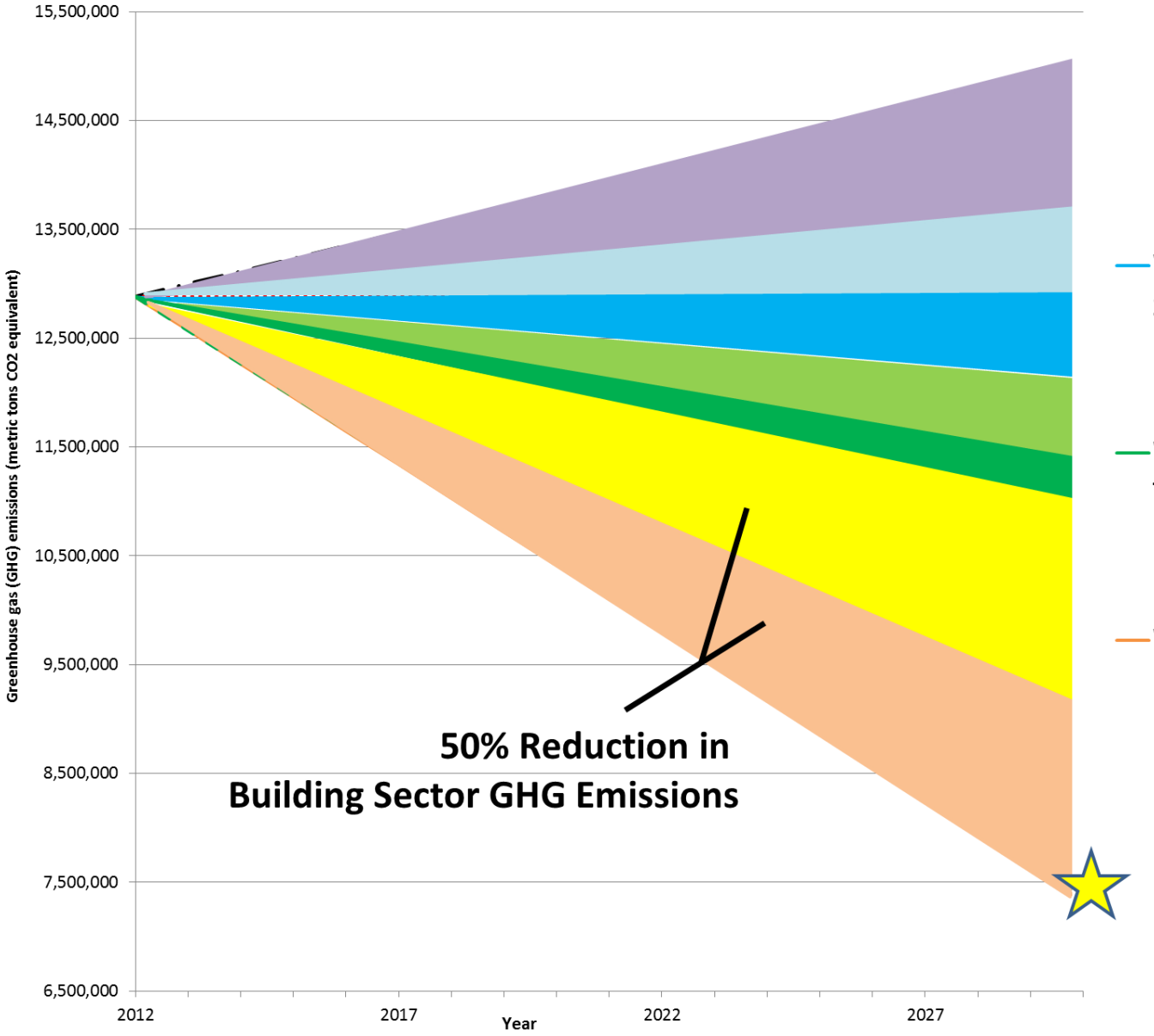
KING COUNTY-Cities CLIMATE COLLABORATION

New Energy Cities

90% Renewable Energy Use and No Coal



Combined: 50% Red. in Building Sector GHG



Wedges 1-3: Existing Federal and State Laws

Wedges 4-5: 25% Reduction in Transportation GHG Emissions

Wedge 7-8: 50% Reduction in Building Sector GHG Emissions

40% GHG Emissions Reduction by 2030

KING COUNTY-Cities CLIMATE COLLABORATION

New Energy Cities

Pathways to 40x30:
Sample County-City Reduction Strategies

Federal and State Action

Pathway: Support federal & state action to reduce GHG emissions

- Support implementation of Washington State Energy Code and Renewable Portfolio Standard
- Support adoption of proposed statewide clean fuel standard

Transportation and Land Use

Pathway: At least 25% reduction in transportation GHG emissions

- Secure funding to sustain and expand transit in King County, with goal of doubling public transit service by 2040
- Build on existing partnerships to expand use of low/zero-emission vehicles

King County-Cities Climate Collaboration | New Energy Cities

Pathways to 40x30:
Sample County-City Reduction Strategies

Energy Sources

Pathway: 90% renewable energy and no coal in electricity

- Partner w/ local utilities to help transition to increasingly renewable energy resources, meet demand through energy efficiency, and phase out fossil fuels

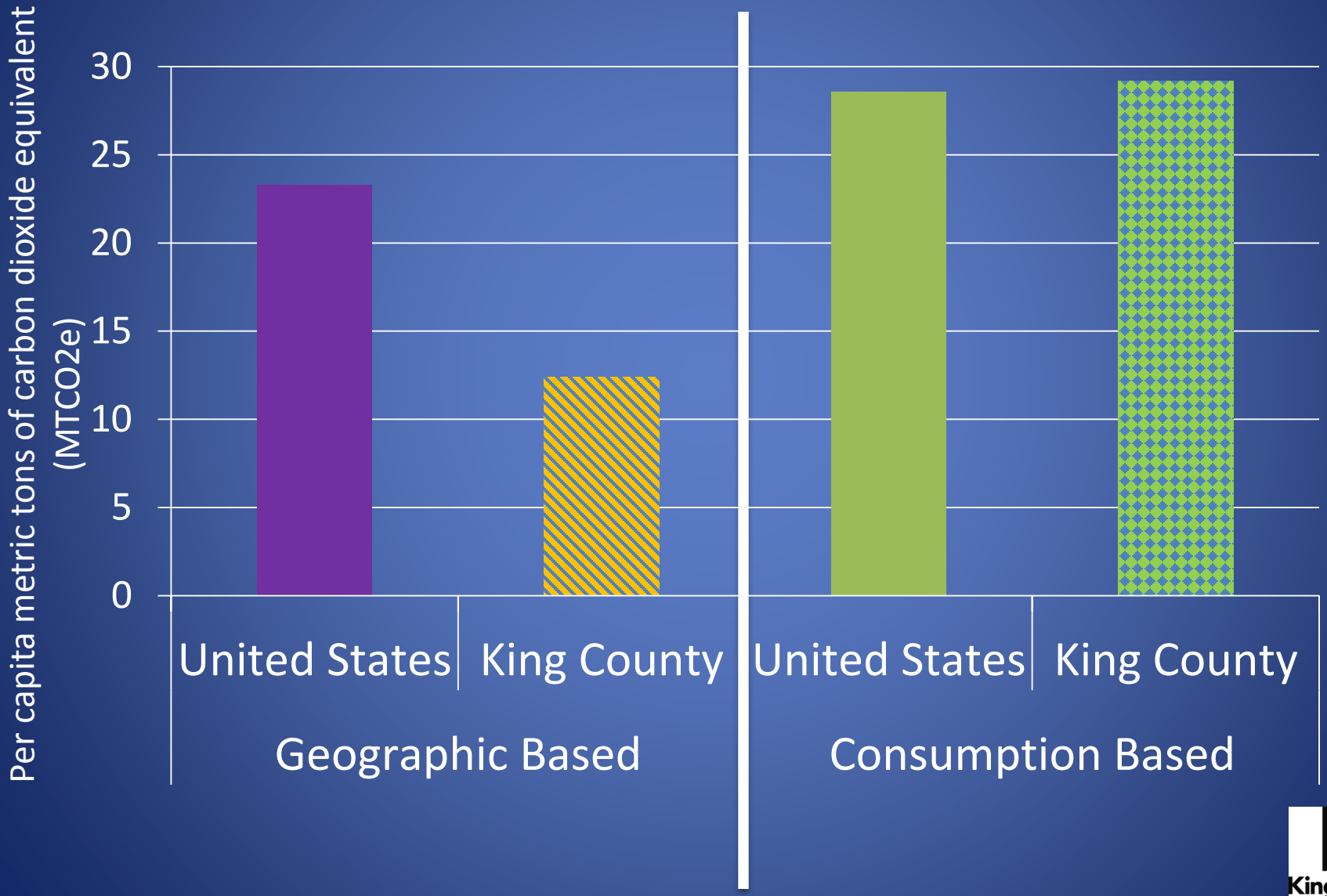
Green Building and Energy Efficiency

Pathway: Reduce energy use in existing buildings 25% by 2030, and achieve net zero energy use in new buildings by 2030

- Develop a multi-city partnership to build a more robust regional retrofit economy, expanding on existing residential and commercial programs
- Lead the way to “net zero” through continued innovation in benchmarking, codes, ordinances, and partnerships that focus on building performance

KING COUNTY-Cities CLIMATE COLLABORATION New Energy Cities

“Other” GHG Emissions in King County



King County

"Other" GHG Emissions
Sample County-City Reduction Strategies

Consumption and Materials Management

- Increase waste prevention, reuse, and recycling outreach and education

Forests and Farms (Carbon Sequestration)

- Partner on Transfer of Development Rights initiatives to focus development within the Urban Growth Area, reduce development pressure on rural lands, and protect resource lands

Government Operations & Infrastructure

- Partner to implement sustainable purchasing efforts, such as recycled paper policies and clean vehicle fleet standards, and green infrastructure

Western WA
CLEAN
CITIES

General Findings

- Deep emissions reductions are ambitious but feasible
- Existing laws are important, but they alone will not achieve the goal
- State, regional, and local levers of change are all essential—and available— to meet 2030 & 2050 goals
- Collective local action is needed to meet ambitious GHG reduction targets

Achieving 40x2030 and 80x2050 is possible, but requires bolder, more organized action

KING COUNTY-Cities CLIMATE COLLABORATION

New Energy Cities

Thank you!

Elizabeth Willmott
Climate Solutions' New Energy Cities Program
elizabeth@climatesolutions.org

KING COUNTY-Cities CLIMATE COLLABORATION

New Energy Cities